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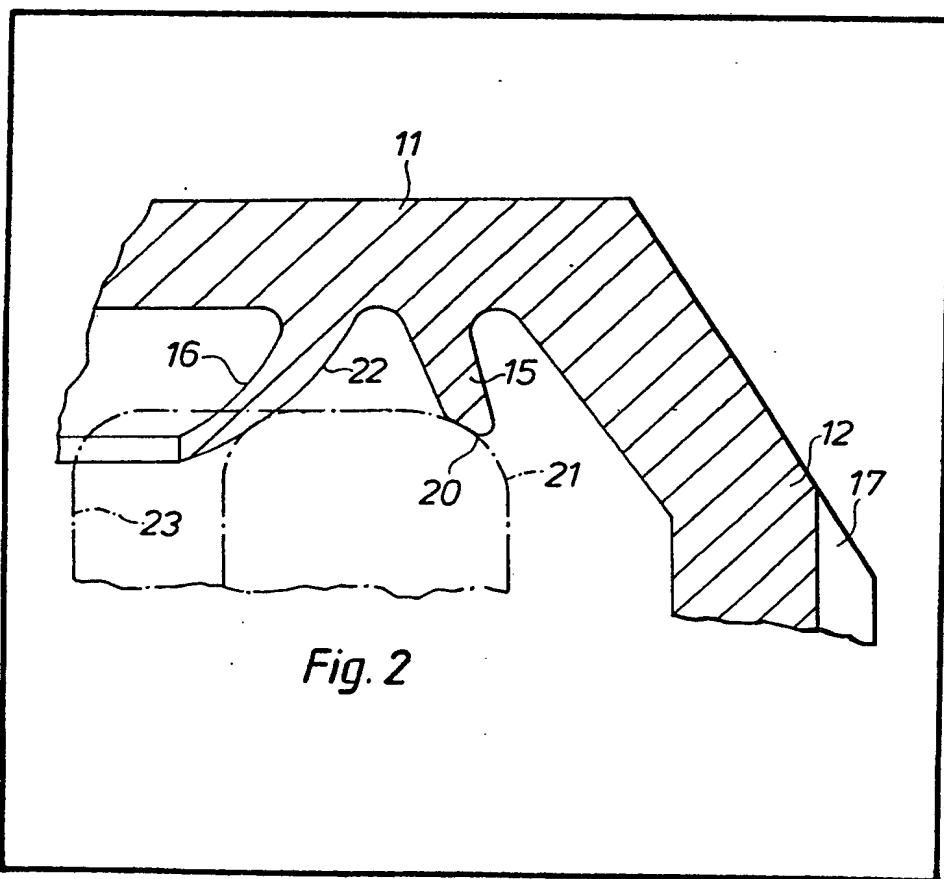
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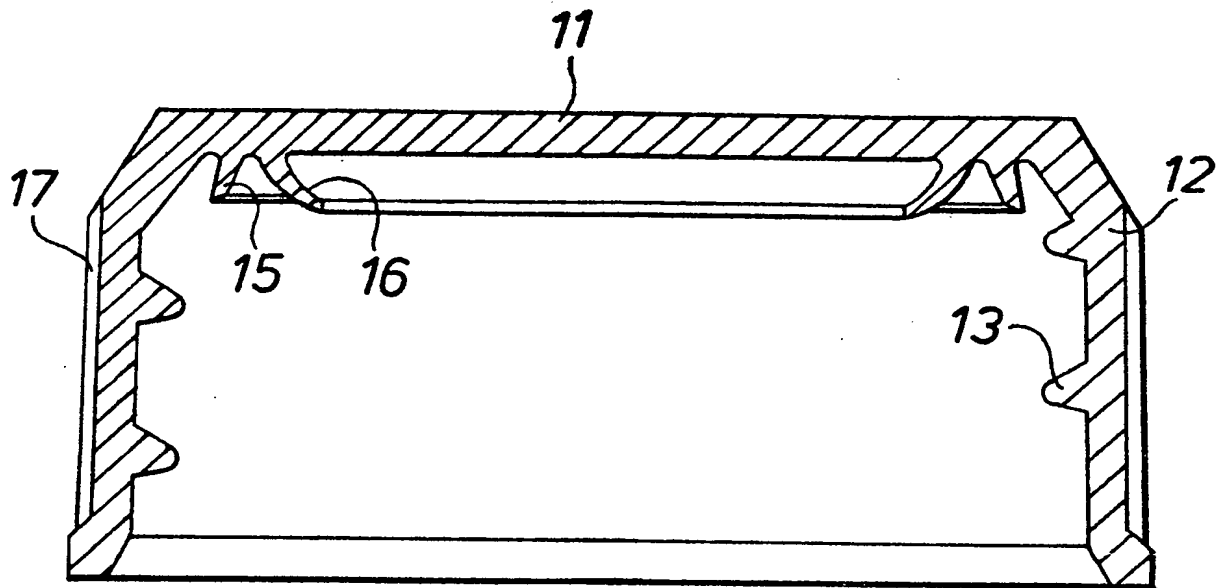
(54) Double-seal container caps

(54) The cap is a one-piece plastics moulding which is screw-engageable on a container. The top of the cap has inner and outer annular flanges (16, 15) which diverge and engage the

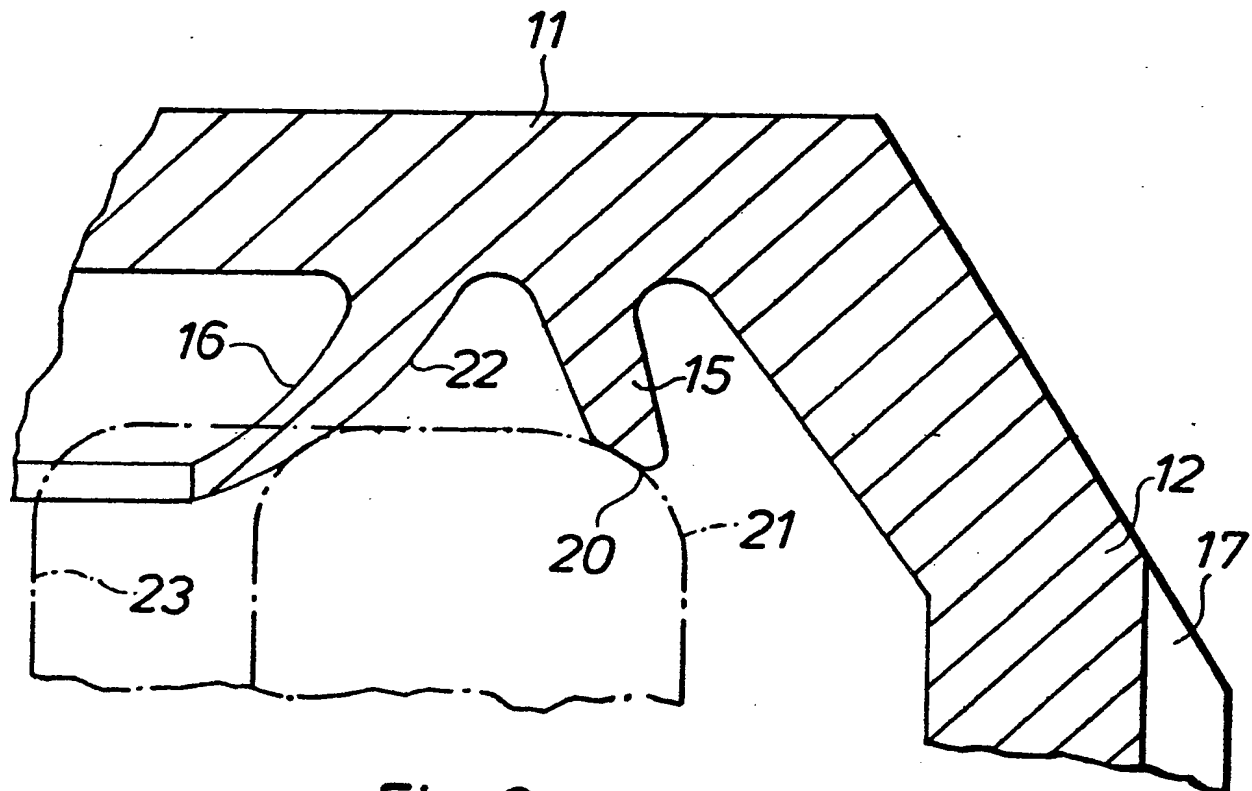
container rim to form a double seal. The inner flange is longer than the outer flange and has a convex surface (22) which engages the inner edge or the top of the rim. The outer flange is relatively short (and has a bevelled end face (20) which abuts the outer edge (21) of the rim.



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**Fig.1**



**Fig. 2**

## SPECIFICATION

**Double-seal container cap**

This invention relates to a double-seal container cap of the type which is moulded with a top, a skirt provided with internal screw-threads, and internal sealing flanges for engaging the rim of a container on which the cap is screwed.

Caps of this type are well known. One such cap is known from U.S. Patent Specification No. 3232470 (Gibson) in which a single annular boss projects axially inwardly from the inner face of the top of the cap. This boss has a pair of adjacent annular resiliently flexible sealing flanges projecting therefrom and, as viewed in cross-section, diverging, with both flanges being obliquely inclined to the cap axis and to the inner face of the top. In use, the inner surface of the radially outer flange engages with the top of a container rim and the outer surface of the radially inner flange engages the inner edge of the rim, both flanges tending to be deformed away from each other, in use.

U.S. Patent Specification No. 3463340 (Lindstrom) describes an arrangement in which the inner and outer flanges are spaced further apart and depend directly from the inner face of the cap. The outer flange is adjacent the skirt, so as to be forced into contact with the skirt, when engaged with the outer edge of a container rim, to effect a locking action. The inner flange engages the inner edge of the rim. The flanges diverge only slightly and are only slightly inclined to the cap axis. The inner flange will not, therefore, always seal against a rim where there is much variation in rim thickness due to manufacturing tolerances.

Swiss Patent Specification No. 564461 (Bovard) provides relatively rigid annular ridges which engage both opposite edges of a rim, with possible additional such ridges engaging the top of the rim. This rigidity also means that sealing is not effective with rims of varying sizes.

PCT Patent Specification No. WO79/00774 (Suncoast) provides an arrangement similar to Gibson, but the two flanges depend directly from the inner face of the top of the cap. The outer flange is at only a slight angle to the cap axis and is placed near to the skirt, similar to the arrangement in Lindstrom, to ensure that the inner face of the flange engages with the edge of the rim of a container rather than with the top of the rim.

In accordance with the present invention, there is provided a double-seal container cap which is a one-piece plastics moulding having a top and a skirt provided internally with means for screw-engagement on a container, the inner face of the top of the cap being provided with a pair of adjacent, divergent resiliently flexible, annular flanges concentric with the cap axis, the outer face of the inner flange being engageable in use with the inner edge on the top of the rim of a container and being convex, and the outer flange being shorter than the inner flange and having an end face between its inner and outer faces, the

end faces engaging with the outer edge of the rim of a container, in use.

The outer flange, therefore, centralises the cap and the curvature of the outer face of the inner flange facilitates good sealing engagement with either the inner edge or the top of the rim, depending on the thickness of the rim. The cap, therefore, provides a double seal with rims of wide tolerances.

Reference is now made to the accompanying drawing, wherein:—

Figure 1 is a sectional view of a cap according to the invention; and

Figure 2 is an enlarged view of a part of the cap.

The cap shown is a one-piece injection moulding having a top 11 and a skirt 12. The skirt has inner screw-threads 13 for engaging with complementary threads on a container and external ridges 17 to facilitate gripping.

The top 11 is provided on its inner face with dependent annular flanges 15, 16, which are concentric with the cap axis. Each flange is generally of constant thickness, so as to be resiliently flexible, giving the appearance of a finger in cross-section. The two flanges are adjacent each other where they adjoin the top 11 and diverge, both being obliquely inclined to the axis.

The outer flange 15 extends at approximately 15° to the axis and has an end face 20 between inner and outer faces. This end face is inclined at approximately 60° to the axis and defines a bevelled end of the flange, with the bevel on the inner edge of the flange, relative to the axis. This end face 20 engages with the outer edge of a rim 21 of a container, in use, and serves to centralise the cap relative to the container, as well as to seal against the rim. The end face may be concavely curved to follow the contours of the edge of the rim, which is usually convex, as shown.

The inner flange 16 extends generally at about 45° to the axis, but is curved. The flange has its outer face 22 formed with a convex curve. As shown in Figure 2, this curved face may sealingly engage the inner edge of the rim 21, but on a wide rim, as shown at 23, will sealingly engage with the top of the rim. The curvature of the face facilitates sealing with any rim whose thickness varies between the two extremes shown. This flange resists excessive force being applied to the outer flange 15, as the cap is tightened on the rim.

**Claims**

1. A double-seal container cap which is a one-piece plastics moulding having a top and a skirt provided internally with means for screw-engagement on a container, the inner face of the top of the cap being provided with a pair of adjacent, divergent resiliently flexible, annular flanges concentric with the cap axis, the outer face of the inner flange being engageable in use with the inner edge or the top of the rim of a container and being convex, and the outer flange

being shorter than the inner flange and having an end face between its inner and outer faces, the end face engaging with the outer edge of the rim of a container, in use.

- 5 2. A double-seal container cap according to Claim 1 in which the outer flange is angled at approximately  $15^\circ$  to the axis of the cap.
3. A double-seal container cap according to Claim 1 or 2, in which the end face of the outer
- 10 flange is inclined at approximately  $60^\circ$  to the axis

of the cap to define a bevelled face with the bevel on the inner edge of the flange.

4. A double-seal container cap according to Claim 1, 2 or 3, in which the outer face of the
- 15 inner flange extends generally at an angle of about  $45^\circ$  to the axis of the cap.

5. A double-seal container cap constructed substantially as herein described, with reference to the accompanying drawings.